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### The Larynx in Leprosy

Leprosy is a contagious wasting constitutional disorder caused by the acid-fast *Mycobacterium leprae* first described by Hansen in 1874.

Both from the clinical and histopathological points of view, the manifestations of leprosy may be varied. The classification which divides the disease into three distinct types—the lepromatous (malignant or gravis), the tuberculoid (benign or mitis), and the indeterminate (undifferentiated)—is being used at the State Leprosarium, University of Puerto Rico and is adhered to throughout this presentation.

The premise is generally accepted that leprosy is contracted through the particular susceptibility of children, especially those under 3 years of age, and that the disease will continue indefinitely unless they are properly protected from contact with the infective leper. Except in rare cases, adults—even after prolonged exposure to the contagion—do not seem to contract the disease.

Generally speaking, leprosy characteristically presents many acute phases and spontaneous recessions. In the lepromatous type, these acute episodes or so-called lepra reactions are characterized by headaches, high fever preceded by chills and with morning remissions and evening exacerbations, weakness, general malaise, bacteremia, cutaneous edema, swollen mucous membranes, edematous eyelids, photophobia and lacrimation, and a rash of small maculae to giant urticaria over the face and extremities which, in children, may at times simulate measles.

In the tuberculoid patient, these reactions are characterized by exacerbation of the lesions which become more inflamed, edematous, reddened, painful, and hypersensitive. The affected nerves are swollen and tender; occasionally, low-grade fever may appear.

These acute reactions are of relatively short duration, although they may last for weeks and are often followed by recession of the lesions and prolonged periods of apparent quiescence. They may, however, usher in steadily progressive changes. Pain may be persistent and agonizing during these reactions.

The distinguishing features of leprosy in children, according to Elliott, are swelling and tenderness about the tip of the nose and edema and infiltration about the alar cartilages. Epistaxis is a common symptom and examination of the nose will reveal a granulomatous lesion on the septum containing the characteristic acid-fast *M. leprae*. Pendulous lobes with nodules on the auricle indicate that the disease has been long established. Madarosis is generally bilateral and affects the outer half or third of the eyebrow. When present, it is indicative that leprosy has been clinically active for approximately 5 years.

Tuberculoid Leprosy. A typical lesion is a pale flat macula, strongly circumscribed with diminished pigment, often having a finely granular or papular periphery and loss of sensory perceptions of varying degrees.



The temperature sense may disappear first, with subsequent diminution of pain and light touch perception. These sensory changes are more noticeable toward the center of the lesion. Virtually all of these lesions will show anhidrosis.

Sometimes, raised edematous sharply demarcated lesions may occur in the form of plaques, rings, or as gyrate borders of former flat maculae. Their central portion is generally hypochromic and the surface is finely scaled.

The frequent localization of lesions in main nerve trunks may bring about extensive and mutilating deformities. Smooth or nodular swelling may take place rendering the nerves easily palpable and, in certain instances if superficially located, they may stand out quite prominently. The ulnar nerve, the peroneal, the great auricular, and the supraorbital are the nerves most frequently affected.

Cases of tuberculoid leprosy show high resistance to the multiplication and dissemination of the bacilli, are generally benign, tend to be stable, and give a positive lepromin reaction. The organism is not frequently found in the lesions or in nasal smears except in reactional cases. There is a strong tendency to spontaneous regression in the absence of repeated reaction. They are usually noninfectious.

Indeterminate Leprosy. Sensory disturbances are rather constant, but of varying degrees. The skin lesions may be few or may even occur singly; they are usually macular—either hypochromic, erythemahypochromic or erythematous. These cases tend to be unstable with a variable course as to persistence, regression, progression, or transformation into one of the "polar" types. They may give a negative or moderately positive lepromin reaction; *M. leprae* is not found as a rule in the lesion. They are usually noninfectious.

Lepromatous Leprosy. This type concerns the laryngologist most because it presents lepromatous lesions not only in the skin, but also in the mucous membranes of the nose, pharynx, and larynx. It bears a graver prognosis and is a more malignant type of the disease. It is the most highly contagious form and the *M. leprae* is abundant in the lesions and nasal secretions. Reaction to lepromin is negative. There is a minimal resistance to the existence, multiplication, and dissemination of the bacilli.

Usually, a nodular thickening of various areas of the skin exists, although at times a diffuse induration may take place. The lesions may develop anywhere, but appear most commonly on the face, especially affecting the ear lobes, forehead, eyebrows, nose, and the malar prominences. The skin over the elbows and knees is also frequently involved. The lepromas are darker than the surrounding skin.

The mucous membranes are early involved in this type of leprosy, as happens with the nose where a granuloma may form on the anterior portion of the septum or ulceration may take place, eventually causing total destruction of the cartilaginous septum and sinking of the tip. This, aggravated by



cicatricial contraction at the site of lesion on the alae, cicatricial stenosis of the nostrils, and nodular deformities of the nasal lobule, gives rise to a hideous-looking nose which, together with the enlarged nodular ears and nodular face, changes the facial expression of the person into the so-called "facies leontina" of leprosy.

The lepromata may break down and ulcerate or resorption may take place. Permanent changes in proportion to the severity of the process will occur in the form of scars, deformities, or mutilations.

Nerve trunks may be the site of lepromatous changes with clinical signs indistinguishable from those in other types of leprosy. Destruction of the eyes with resulting blindness is not unusual in advanced cases.

An important factor in making the diagnosis is to be leprosy-conscious and to thoroughly search, when suspicion-arousing laryngeal signs or symptoms are present, for nasal, skin, and nerve lesions. This requires a careful examination of the entire body and scrapings of the anterior portion of the septum nasi for preparation of smears for bacteriological examination.

The use of sulfone derivatives in the treatment of leprosy has been revolutionary during recent years. Among them, are glucosulfone (Promin), sulfoxone (Diosone; Diamidin), thiazolsulfone (Promizole), and Sulphetrone. All can produce a variety of toxic manifestations with selectivity for the hematopoietic system, occasionally effecting changes in personality.

The first beneficial effects of sulfone therapy are observed in lesions of the mucous membranes, especially of the nose, mouth, and larynx, to the extent that the tracheotomies—which were of not infrequent occurrence in previous days—have entirely passed out of the picture during the last few years. Next, sulfone therapy causes the nodular lesions to subside and, finally, the bacilli to disappear from all lesions.

Among the antibiotics, streptomycin sulfate seems to have beneficial effect in the treatment of leprosy; Estella believes that it is one of the best and most efficacious drugs for treating the leprous reaction in lepromatous patients.

The thiosemicarbazones (T.B.I.) have a definite effect on the disease, but any conclusions drawn at this time would be premature. They are used in cases where the sulfone derivatives are contraindicated.

Isonicotinic acid hydrazide is used experimentally at the Insular Leprosarium of Puerto Rico, and so far, it seems to be a promising drug. Besides having some specific action against the lesions, it causes the patients to become optimistic to euphoric and gain in weight.

Intravenous corticotropin (ACTH) has also been used at this institution in the treatment of the lepra reaction in lepromatous patients with excellent results, especially when ocular complications are present.

In general, the treatment of leprosy is long-drawn, perhaps tedious, and subject to frequent complications. It should be in the hands of a well-trained specialist who knows the disease well; and it requires on the part



of both the patient and the physician a great deal of patience, hope, faith, and—above all—courage. (MacCormick, C. E. M., *The Larynx in Leprosy*: Arch. Otolaryng., 66: 138-149, August 1957)

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### Staphylococcal Infections in Newborn Infants

The authors recently described the bacteriologic investigation and control of an epidemic of staphylococcal infections associated with the nurseries for the newborn in the University Hospital, Columbus, Ohio. In this epidemic, clinical manifestations were pyoderma, breast abscesses in nursing mothers and infants, and, in a few instances, more serious infections, such as cellulitis, osteomyelitis, pneumonia, and septicemia. More than 50% of the infants admitted to the nurseries during the epidemic developed evidence of infection, and breast abscesses occurred in approximately 30% of the nursing mothers. A single strain of *Staphylococcus pyogenes* bacteriophage Type 42B/47C/44A/52/80/81/ was isolated from all lesions. This organism was sensitive to bacitracin, neomycin, chloramphenicol, erythromycin, carbomycin, novobiocin, and oleandomycin and was resistant to penicillin, streptomycin, and the tetracyclines. Practically all infants who were in the nurseries during the epidemic—whether or not they were clinically ill—showed nasal colonization with the "epidemic" strain at the time of discharge from the hospital. Many colonized infants who were clinically well when they left the hospital developed infections at home. Among 178 hospital personnel intimately associated with the infants, 7 carriers were identified, all of whom were on full-time duty in the nursery. When all the usual measures failed to control the epidemic, the organism was eradicated from the infant population by the oral administration of erythromycin to all infants for one week beginning immediately after birth.

Differentiation between similar strains of staphylococci is fundamental to the study of such epidemics and has been accomplished principally by determining bacteriophage type. By the use of this procedure and the determination of sensitivity to antibiotics, it has been possible to demonstrate in these laboratories that the strains of *S. pyogenes* incriminated in 41 similar, but widely separated, outbreaks occurring during the past 2 years were identical to the organism responsible for the epidemic in Columbus.

The present investigation was undertaken to determine and examine the factors associated with the colonization of infants by *S. pyogenes*. Because infants are continually exposed to many different strains of potentially pathogenic staphylococci during their stay in the hospital, it is important to understand the source and modes of transmission of staphylococci acquired during the first days of life.

During the principal part of this investigation, the strains of *S. pyogenes* isolated from the nasal mucosa of newborn infants were heterogenous and, as



has been demonstrated by Barber, were identical in most instances with the strains carried by some of the nursing personnel. Even though the infants came into intimate contact with the mothers during their stay in the hospital, the mothers were not the immediate source of colonization of the infants.

Throughout this study, the authors were impressed by the marked differences in the capacities of the various strains of *S. pyogenes* to colonize infants. This was demonstrated by the observation that only five strains were responsible for 75% of the colonization and by the additional finding that other strains constantly present among the nurse personnel either failed to colonize or colonized only one or two infants. Under the usual circumstances, only a single strain predominated at any one time in a nursery. Upon transferring the carrier of the predominating strain to a different nursery, that strain would disappear from the infants in the first nursery and reappear in the other and a new strain would appear and predominate in the nursery from which the carrier had been removed. This indicates that, under a regimen of "hexachlorophene bathing," the predominating strains were incapable of being perpetuated in the infant population in the absence of a permanent carrier to constantly infect new infants. Should such an organism possess sufficient pathogenicity to cause clinical infections, the cases probably would be sporadic and disappear with change in personnel.

One strain of *S. pyogenes*, easily recognized because of its distinctive resistance to chloramphenicol, exemplified what may happen when an organism with a high capacity to colonize becomes established in a nursery where "dry" skin care is practiced. This organism rapidly colonized 60% of the infant population despite the fact that seven other strains were present at the same time in both infants and nursing personnel. Even in the absence of a recognized permanent carrier among the nursery personnel, this strain maintained itself in the newborn population apparently by infant-to-infant transmission.

The marked increase in the rate of nasal and skin colonization observed in infants who received "dry" skin care demonstrates the effectiveness of bathing with a detergent solution containing hexachlorophene for preventing infant-to-infant transmission of *S. pyogenes*. In the absence of a permanent adult carrier, the chloramphenicol-resistant strain was completely eliminated from both the infant population and the nursery personnel within 10 days after reinstitution of hexachlorophene baths.

A comparative survey of the distribution of *S. pyogenes* in the nursery environment during periods of "dry" skin care and, at times when "hexachlorophene bathing" was practiced, revealed great differences in the number of organisms present. For example, during the periods of "dry" skin care, *S. pyogenes* was isolated from crib railings, liners, and mattresses, and articles that were commonly handled by nursing personnel. Surfaces on which bedding lint collected invariably yielded *S. pyogenes*. During periods when "hexachlorophene bathing" was practiced, significantly fewer organisms



were isolated from these same areas. It would appear that when a strain has become established in a nursery where "dry" skin care is practiced, inhalation of dessicated air-borne vernix or blanket lint contaminated with staphylococci results in an increased rate of nasal colonization. Hexachlorophene bathing when properly performed appears to have a twofold action: (a) the mechanical removal of vernix before it becomes dry and air-borne, and (b) the prevention of skin colonization through its local antibacterial action.

The role of the transient carrier as a responsible source of staphylococci which colonize infants cannot be completely assessed from the present data. Because most carriers were persons who harbored relatively few coagulase-positive staphylococci for short intervals—and then only when a particular strain predominated in the infant population—they probably played a minor role. However, the high incidence of transient carriers observed in this study also occurs during epidemics of staphylococcal infections in nurseries. Although removal of the permanent carrier from contact with infants is necessary for ultimate control of such epidemics, removal of all carriers is not necessary if antibiotic prophylaxis is used to prevent colonization of causal strain in the newborn population. As was observed in this study and in an epidemic, when the prevailing strain disappears from the infants the transient carrier state among nursing personnel also disappears. The permanent carrier then can be readily detected and removed from contact with infants and the prophylactic administration of the antibiotic can be discontinued without disrupting the operation of the nursery. (Baldwin, J. N., et al., Staphylococcal Infections in Newborn Infants. III. Colonization of Newborn Infants by Staphylococcus Pyogenes: J. Dis. Chil., 94: 107-115, August 1957)

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#### Atherosclerosis and the Fat Content of the Diet

This discussion summarizes and evaluates evidence for and against the concept that the fat content of the average present-day North American or north European diet is a significant factor in the genesis of cerebral, myocardial, renal, or peripheral atherosclerosis. To date, there is no incontrovertible evidence for such a relationship; nevertheless, a strong case is developing to suggest that the nutritional status of an individual is an important environmental factor in the etiology of this disorder. The total fat and the type of fat in the diet are among the nutritional factors particularly involved.

A review of this kind may provide nutritionists and physicians with a guide when health recommendations are made to groups or to individuals. In formulating these recommendations, however, one must bear in mind



that the results of clinical studies on patients and experimental studies on animals are not necessarily applicable to healthy individuals.

It is hoped that the insurance industry and industries concerned with the manufacture, processing and distribution of foods will take responsibility for performing and promoting effective basic as well as applied research on the problem of the relationship between diet and atherosclerosis. Industry is usually generous in the support of research for product development, but has given very limited support to basic research in this vital health field, even though the results of such investigative work would enable management to plan more intelligently for the future. The need for reliable information and appropriate action is urgent.

One of the first things that occurs to lay individuals in thinking about chronic diseases is a possible change in diet. Frequently, this reasoning is applied to situations in which diet is of little or no importance. The result is a flood of diet fads and quackery. In the case of atherosclerosis, there is some evidence that diet may be of considerable importance. To determine more exactly this possible role of diet in the etiology of atherosclerosis is now the responsibility of research workers.

Atherosclerosis, in all probability, has no single cause. It results most likely from a combination of factors, or is as Page suggests, a "multifaceted disease." Among those facets presently implicated are heredity, diet, morphologic and chemical anatomy of the blood vessel wall, arterial blood pressure, lipid content of the blood, and sex. Atherosclerosis is a focal lesion. Because its consequences are widely variable, there is no practical means of clinical diagnosis of the uncomplicated potentially reversible lesions. A large plaque may be so located as to cause little injury and a small one may be placed so strategically in a coronary vessel as to cause death by direct occlusion. Atherosclerosis is believed by some investigators to be episodic, with the plaques building up rapidly in days or weeks and remaining quiescent for months or years thereafter. Many workers believe this process to be reversible—at least in its early stages.

Atherosclerosis, cerebral thrombosis, and myocardial infarction are diseases in which numerous factors are involved. Diet and nutrition are important factors in experimental atherosclerosis and, very probably, in the human disease. Thrombosis and infarction of the cerebral, cardiac, and renal vessels occur in severely sclerosed arteries, but, so far, neither has been clearly produced experimentally.

Evidence is presented to suggest a possible general association with high fat consumption, but it is difficult to disentangle this from caloric balance, exercise, changes in body weight, and other metabolic and dietary factors that may be involved. Thus, the evidence at present does not convey any specific implications for drastic dietary changes, specifically in the quantity or type of fat in the diet of the general population on the premise that such changes will definitely lessen the incidence of coronary or cerebral artery disease. On the other hand, the fact that obesity is a nutritional failure, that it is



caused by consuming more energy than one expends, that dietary fats are the most concentrated source of energy, providing some 40 to 45% of the daily caloric intake, suggests that many should consume fewer calories; for most, this will mean eating less fat.

Prudence, as well as habit and taste, will dictate the selection of a diet with some fat. Diets providing 25 to 30% of the calories from fat, rather than the current 40 to 45% in the American diet, can still provide palatable meals for accustomed tastes.

The key points of nutritional common sense for better health in general, and most likely in regard to atherosclerosis specifically, consist of a balanced, varied diet that adjusts total calories to reach or maintain a desirable weight. Such a diet should provide more protein from lean meat, fish, poultry, and animal products, cereal and grain products, and a reasonable selection of fruits and vegetables. The fat content should be sufficient only to meet caloric and essential fatty acid demands.

These conclusions obviously apply to the general population and not to patients or to individuals with a strong family history of early deaths from cardiovascular disease who are being observed with some regularity by their physician. Here, the newer concepts of nutrition readily suggest various types of diet therapy that may prove useful to certain patients. Investigative procedures of this type—together with continued basic research—will in time provide the facts upon which sound dietary recommendations may be made to the public at large and which may help in lessening the prevalence of cerebral and coronary disease with consequent stroke and myocardial infarction. (Page, I.H. and Co-Workers, Atherosclerosis and the Fat Content of the Diet - A Report to the American Heart Association, the American Society for the Study of Arteriosclerosis, and others: Circulation, XVI: 163-175, August 1957)

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#### Diagnosis of Carcinoma of the Right Colon

The 5-year survival rate following resection of carcinoma of the cecum and ascending colon at the Lahey Clinic is 46%. This is no higher than the survival rate for carcinoma of the transverse, descending, or sigmoid colon, yet a cancer of the cecum or ascending colon can be removed along with 12 inches or more of bowel on either side of the lesion, plus all of the mesentery to the right half of the colon. It is not uncommon for a carcinoma of the right colon to reach such a size that it is easily palpable through the abdominal wall and still be completely limited to the bowel and adjacent mesentery. A lesion of similar size in the left colon is usually associated with liver metastasis. A carcinoma of the right colon may be associated with marked anemia and still be curable by surgical resection. A similar degree of anemia in a patient with carcinoma of the left colon usually indicates



far-advanced malignant disease. It would seem that the prognosis for patients with carcinoma of the cecum and ascending colon should be better than it is.

At the clinic, all patients with carcinoma of the cecum or ascending colon are submitted to laparotomy and the lesion is resected in over 90%. If extensive liver metastases are present, the lesion is bypassed by anastomosis of the terminal ileum to the transverse colon.

For any significant improvement in the 5-year survival rate for patients with carcinoma of the cecum and ascending colon, it is obvious that one must return to the problem of earlier diagnosis. The longer the interval between the origin of the carcinoma and its surgical removal, the greater the opportunity for extension of the malignant process and the less opportunity for a cure. This is true despite the fact that an individual patient with cancer of the colon may show liver metastases even though his lesion is small or "early" and his symptoms have been of short duration. Fortunately, the converse also occurs and many patients with carcinoma of the colon—particularly the right colon—will have large growths with symptoms for many months and still show no sign of metastasis.

In spite of the publicity given to cancer in recent years, little progress has been made in decreasing the time interval between onset of symptoms and the diagnosis of malignancy in patients with cancer of the colon and rectum. Until this can be done, a marked improvement in the 5-year survival rate cannot be expected. If it were possible to submit everyone over 45 years of age to a periodic physical examination, including a complete gastrointestinal study, this interval would decrease. This program is practical only on a limited scale at present.

However, there is one aspect of the problem about which something can be done—the delay in the establishment of the diagnosis after the patient first consults a physician. A significant delay in diagnosis after the patient first consulted a physician occurred in 28% of the patients with carcinoma of the colon and rectum seen at the clinic during 1953. For those patients with carcinoma of the cecum, it was 50%.

In an effort to determine the factors responsible for this delay, the records of 80 consecutive patients with cancer of the cecum and ascending colon have been reviewed. These patients were seen at the clinic between 1951 and 1956.

The majority of patients were from 50 to 80 years of age. The oldest was 86 and the youngest was 30. Only three patients were under 45 years of age. There were 41 men and 39 women.

Twenty patients, or 25%, had had symptoms for a year or longer before the diagnosis was established. Thirty-two, or 40%, had had symptoms for 6 to 12 months. Fourteen had had symptoms for 6 weeks to 6 months. Thus, at present, 65% of the patients seen at the clinic with carcinoma of the right colon have had symptoms for 6 months or more. Swinton and Counts found that the interval between onset of symptoms and definitive



surgical treatment averaged 7 months for 901 patients operated on at the clinic for carcinoma of the colon and rectum. Schutt and Walder found an average duration of symptoms before diagnosis in patients with carcinoma of the right colon of 10 months.

Fifty-five (68.7%) of 80 patients with carcinoma of the cecum or ascending colon were treated for 6 weeks or more before the correct diagnosis was made. Thirty-five of the 55 patients did not have a barium enema examination as a part of their initial diagnostic study. Seven had had an upper gastrointestinal study, but no barium enema. In eight cases, the barium enema films were read as normal and were not repeated. In five, the barium enema study showed questionable pathologic change in the right colon, but the study was not repeated. A carcinoma of the cecum may be revealed only in the lateral roentgenogram.

How easily the diagnosis may be missed is indicated by the fact that 43.8% of this group did not have abdominal symptoms in the early stage of the disease. Their symptoms were weakness, fatigue, pallor, anorexia, and loss of weight. Abdominal distress was the initial symptom in 36, or 45%. It was usually mild and often intermittent for weeks or months. In only 8.7% was the first symptom directly referable to the gastrointestinal tract, and this was the common complaint of constipation.

There is a needless delay in making a diagnosis in many patients with carcinoma of the cecum or ascending colon. This is due to the use of "symptomatic" or "expectant" treatment without adequate diagnostic study. A barium enema examination should be carried out in any patient with unexplained weakness, pallor, or recurrent abdominal distress. (Colcock, B, P. Diagnosis of Carcinoma of the Right Colon: *Postgrad. Med.*, 22: 151-156, August 1957)

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### Desmoid Tumors

Desmoid tumors do not occur commonly. They are usually found in muscles of the anterior abdominal wall, but have been reported as arising from a wide variety of other muscular sites. The authors recently encountered a large desmoid tumor that arose from the intercostal muscles of the right upper thorax; because they have been unable to find any previous report of a desmoid tumor that involved the thoracic wall, it seemed worthwhile to review this case.

Pack and Ehrlich defined a desmoid as "an unencapsulated, infiltrating fibroma of fascial or aponeurotic origin with a microscopic appearance which varies from that of acellular fibroma to that of a cellular, low-grade fibrosarcoma." The concept that desmoid tumors arise from fibroblastic proliferation in the deep fascia between muscles or in aponeuroses is generally accepted.



The incidence has been variously reported. Pack and Ehrlich reported 17 cases of desmoid tumor in various locations in 50,346 admissions for neoplastic disease at the Memorial Hospital between 1917 and 1943. Musgrove and McDonald reported that 85 desmoids of the abdominal wall and 45 in other sites had been encountered at the Mayo Clinic in the period 1906 through 1945. In most reported series, desmoids are said to have occurred in the abdominal wall three or four times as frequently as in extra-abdominal locations.

Females are affected about five to seven times as frequently as males chiefly because of the preponderance of the more common tumors of the abdominal wall in females. However, Musgrove found that even the extra-abdominal tumors occurred about two and one-half times as often in females as in males. As a rule, desmoid tumors tend to occur in females more frequently during the childbearing age, namely 20 to 40 years. In males, they most often occur between the ages of 40 and 60 years.

There are two current concepts of the etiology of these tumors. The first concerns the association of trauma. A history of trauma can be obtained in a sizable proportion of cases. As in the present case, it may be a blow of varying severity which precedes the diagnosis of the tumor by a short or relatively long period. Similarly, the occasional location in an old operative scar has been noted by several authors. Trauma of the muscles of the abdominal wall during pregnancy and parturition has been implicated, the mechanism apparently being rupture of muscle fibers and secondary fibroblastic proliferation in the resulting hematoma.

The second concept of etiology is that the tumors are in some way related to the endocrine system. A repeated clinical observation is that desmoids of the abdominal wall tend to occur in women who have borne children. Furthermore, in Pack and Ehrlich's series of 17 abdominal desmoid tumors, all female patients except one had noted their tumor either during pregnancy or within one year following delivery. Stout, in 1948, reported 12 cases from the Presbyterian Hospital in New York. All were women; 8 had borne children, 2 had not, and in 2, this factor was not known.

From a gross pathologic standpoint, desmoid tumors are firm and usually unencapsulated. They tend to invade and replace adjacent muscle tissue. They are ovoid and seem to extend in the direction of the muscle fibers. The cut surface shows "whorls" much like uterine fibroids. Their color varies from gray or white to yellow. The blood supply is usually scant, but unlike other tumors with poor blood supply, they seldom undergo necrosis unless malignant change—which is rare—has occurred.

Histologically, the tumors present a fibroma-like appearance; cellularity is varied, but many dense collagenous strands make up the bulk of the tumor. Striated muscle in various stages of atrophy is seen near the periphery. Tumor giant cells are absent and no pathologic mitotic figures are seen, although rarely a normal one can be found. Although locally invasive, the tumors are histologically benign.



According to Waugh, Musgrove and McDonald, Pearman and Mayo and others, these tumors, regardless of their anatomic location, are identical in morphology and behavior.

The current treatment involves radical block resection of the tumor and a surrounding area of normal-appearing tissue, when anatomically possible. Dissection of contiguous lymph nodes is not necessary because the tumor enlarges by direct invasion and does not metastasize. While there are insufficient data and experience to warrant the advocacy of radiation castration or the administration of hormones as primary treatment, the endocrine relationship noted seems worth remembering. Radiation therapy is apparently not effective except in certain instances in which castration is incidental to the treatment. It is well to emphasize that, although few patients die from the effects of the tumor, the rate of local recurrence is very high, being in the neighborhood of 60% for tumors located in the abdominal wall and about 75% for those located extra-abdominally. (Gatchell, F.G., Clagett, O.T., McDonald, J.R., Desmoid Tumor of Intercostal Muscles and Thoracic Wall: J. Thoracic Surg., 34: 184-189, August 1957)

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### Tetanus of Oral Origin

Although widespread immunization has greatly reduced the incidence of tetanus, on rare occasions the dentist may have to differentiate this disease from certain common dental conditions. This is due to the facts that (a) trismus is one of the earliest symptoms of this highly fatal disease, and (b) tetanus occasionally may arise from oral foci. The purposes of this article are to discuss the disease briefly, to review previously reported cases of tetanus of oral origin, and to report an additional case in which the portal of entry was presumably a carious tooth.

Tetanus results from the action of an exotoxin liberated by the bacillus Clostridium tetani. This organism in its vegetative form is a slender, slightly motile, gram-positive rod. Under adverse conditions, however, it is capable of spore formation. The spore develops at one end of the bacillus giving it a characteristic drumstick appearance. Tetanus spores are highly resistant to heat, drying, and disinfectants, but exposure to sunlight reduces their virulence and may eventually destroy them completely. When protected from deleterious factors, the spores will remain viable for years.

The tetanus bacillus is saprophytic in nature. It is also an obligate anaerobe, the spores being capable of germination only under diminished oxygen tension. Under aerobic conditions, the bacillus loses the ability to produce its exotoxin.

Clostridium tetani are most commonly found in the soil, in manure, and in normal human feces. They have also been isolated as a contaminant in



the oral cavity. The portal of entry for the organisms is usually a deep penetrating injury as found in compound fractures, bullet wounds, and puncture wounds caused by nails or other sharp objects. In many instances, however, the organism may gain entry into the body through very superficial skin lesions. Carious teeth and postextraction wounds also may be sites of initial invasion.

The incubation period between infection with the tetanus bacillus and the active phase of the disease is usually about one week. However, it may be several days or several weeks. Occasionally, the exact time of initial infection cannot be determined. The time of onset of the disease is not influenced—as heretofore believed—by the proximity of the portal of entry to the central nervous system. Lesions about the head and neck, therefore, are no more dangerous than those of other regions of the body.

The most common premonitory symptom of tetanus is a stiffness or spasm of the muscles of mastication. The exact reason for this is not known, although it may be only a relative phenomenon, the frequent use of these muscles making a disturbance in their function more readily recognizable. Restlessness, irritability, stiffness of the neck, and difficulty in swallowing also may occur relatively soon in the course of the disease. Inability to open the mouth, plus the dysphagia due to involvement of the muscles of the pharynx, seriously interferes with the patient's nutrition. Stiffness of the arms and legs, persistent headache, and chills and fever are other occasional initial symptoms of developing tetanus.

As the disease progresses, widespread persistent muscular spasms occur. The muscles of the neck and back become rigid and the patient has marked trismus. The contraction of the back muscles may be sufficiently great to produce opisthotonus. The facial musculature also may become involved and the face assume a characteristic expression—the so-called sardonic smile or risus sardonicus. Painful tetanic spasms precipitated by relatively slight stimuli, such as noise or jarring of the patient's bed, are a rather common feature of tetanus. Spasm of the laryngeal and respiratory muscles results in cyanosis and asphyxia. Such impairment of respiration may lead to the development of generalized convulsions. In most instances, respiratory obstruction is the eventual cause of death. In other cases, the immediate cause of death is not apparent and can be attributed only to exhaustion.

The diagnosis of tetanus sometimes may be confused with other conditions which produce the same early symptoms. Meningitis and poliomyelitis are examples of some systemic diseases which may result in stiffness of the neck and jaw muscles. More frequently, however, the dentist will encounter trismus resulting from local conditions, such as a pericoronitis around a mandibular third molar, or from a submasseteric or pterygomandibular space infection. It also may be due to a peritonsillar abscess, a traumatic injury to any of the muscles of mastication, or accompanying



temporomandibular joint disturbances. Of great significance, is the fact that while such conditions may be the primary cause of trismus, in some instances, they may mask a superimposed case of tetanus. This is particularly true with compound jaw fractures or facial lacerations. Such patients should routinely be given "booster" doses of toxoid or, if not previously immunized, an injection of tetanus antitoxin. A delay in treatment, when the disease is present, may be fatal. Because mortality is estimated at between 20 and 50%, the importance of early diagnosis is self-evident. (Robinson, I. B., Laskin, D. M., Tetanus of Oral Origin: Oral Surg., 10: 831-837, August 1957)

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#### Histologic Effects of Silver Nitrate on Human Dentin and Pulp

Ammoniacal silver nitrate has been widely used by the dental practitioner since Percy Howe advocated the sterilization of infected dentin in deep carious lesions rather than mechanical removal by bur or spoon with possible exposure and injury to the pulp. Although many other drugs (thymol, phenol, creosol, creosote, zephiran, et cetera ) have also been used to sterilize infected dentin, silver nitrate remains one of the most frequently used medicaments for cavity sterilization.

This investigation was made in order to gather information relative to the effects of silver nitrate on vital human pulp tissue and to describe the reactions of this drug on sound and carious dentin.

All teeth selected for this study were from naval personnel ranging in age from 18 to 28 years. The great majority of these 26 teeth had been ordered extracted because of large carious exposures with severe destruction of the crown. A few teeth (4) which were scheduled to be removed for prosthetic reasons and third molars in severe malocclusion were also utilized.

The application of Howe's ammoniacal silver nitrate (pH-10.0) was standardized. The ammoniacal silver nitrate was applied either to exposed pulp tissue or carious cavities for 5 minutes. Ammoniacal silver nitrate (Howe's) was applied to the carious dentin of 5 teeth and to the caries exposed pulps of 10 teeth. All teeth were sealed with a zinc oxide and eugenol paste to which zinc acetate (5%) had been added as an accelerator. All teeth were extracted for histologic preparation from 9 to 32 days later.

An additional series of 10 teeth was studied primarily to determine the effects of silver nitrate upon dentin and pulp within a short period of time after application. None of these teeth contained pulp exposures after cavity preparation. The standard application of ammoniacal silver nitrate followed by eugenol precipitation was performed upon carious cavities in 5 upper third molars. Three of these teeth were extracted within 5 minutes



after application and 2 after about an hour. Ammoniacal silver nitrate not followed by eugenol was applied for 5 minutes to cavities in one third molar and for 10 minutes in 2 others. These teeth were extracted 10 minutes later.

A saturated aqueous solution of silver nitrate was applied for 10 minutes to 2 teeth which were extracted within 20 minutes after application. Aqueous silver nitrate was applied to the exposed pulp of one tooth. This tooth was extracted 21 days later for histologic analysis.

Histologic examination revealed the following:

1. Ammoniacal silver nitrate is not self-limiting. It does penetrate through sound tubular dentin, both primary and secondary, as well as through carious dentin.
2. Silver nitrate stains the sound and the carious dentin differentially. Carious dentin stains a deep brown. The degenerating tubules under the carious area do not stain at all. The contents of the deeper vital dentinal tubule precipitate the silver ions as black particles of free silver.
3. Damage to the pulp occurs under sound dentin when these are subjected to silver nitrate applications. The black particles of silver eventually reach the pulp tissue.
4. There is a strong tendency by the pulp tissue to localize the injury caused by the silver nitrate.
5. There is considerably less damage under silver nitrate applied directly to exposed pulpal tissue than when the solution is applied to sound dentin. This is because the blood of the underlying hemorrhagic area completely precipitates the silver nitrate, limiting its action and preventing its further penetration.
6. In view of the limited sterilizing action by silver nitrate and its potentially injurious action to the contents of vital dentinal tubules and the odontoblasts as well as the pulp tissue itself, the value of its continued use on an empirical basis is questioned.

(Englander, H. R., James, V. E., Massler, M., Histologic Effects of Silver Nitrate on Human Dentin and Pulp: University of Illinois, College of Dentistry, Chicago; Dental Research Facility, U. S. N. T. C., Great Lakes, Ill., Research Project NM 008 013.10.05, November 1956)

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#### Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.



Surgical Residency Training in the  
United States Navy

World War II forcefully emphasized the imperative need for supplying expert surgical care for battle casualties as near the scenes of combat action and as soon after receipt of injuries as logistics and operational war conditions would permit. The Korean conflict merely served to add to the accentuation of and justification for this concept, with resultant refinements and advances in the techniques and speed of transporting battle casualties to surgical units where early definitive care could be provided for many, often within 20 to 30 minutes or an hour after they were wounded. As a consequence, considerable improvements were made over the outstanding records of World War II, when approximately 97% of all combat casualties reaching definitive surgical care stations survived. Additionally, the sharp reduction of morbidity, the early relief of human suffering, and the elevation of morale among thousands of the wounded were highly important factors not well reflected in statistical tables.

Within a year after cessation of hostilities of World War II, the Bureau of Medicine and Surgery of the Navy Department, fully realizing the urgent requirements of the Naval service for qualified specialists resulting from the rapid demobilization of large numbers of doctors with specialized training and anticipating a continuing and increasing need for an adequate number of these officers in the Medical Corps of the Regular Navy, undertook urgent measures in an attempt to remedy this desperate situation. Thus were established the first augmented and formalized residency training programs in surgery, as well as in other specialties, in the history of the Medical Department of the Navy.

The programs in surgery have been conducted in such a manner as to meet the accreditation requirements laid down by the Council on Medical Education and Hospitals of the American Medical Association, the American College of Surgeons, and the American Board of Surgery. Of particular helpfulness and essence in these endeavors are the great contributions of eminent civilian surgeons who had extended periods of active duty during World War II or acted in the capacity of consultants to the Surgeon General of the U. S. Navy during and since that War. These physicians gave unstintingly of their time, professional and organizational knowledge, and constructive guidance in the original founding of the surgical residency training programs in 1946. These extremely valuable and essential relationships and cooperation with the Bureau of Medicine and Surgery have continued up to the present time, represented by the Reserve Consultants and the groups of Honorary Consultants to the Surgeon General. In addition, it has always been the firm policy of the Bureau to maintain a close liaison with civilian educators and training activities and to obtain the services of a sufficient number of highly qualified civilian consultants to U. S. Naval Hospitals to



meet not only training needs, but also the concomitant demands for improved standards of medical care for military personnel in both teaching and nonteaching type hospitals. Their participation is vigorous, inspired, and realistic, involving, as it does, a close working rapport with a carefully selected and qualified surgical staff in each hospital. These civilian services represent a well-balanced distribution of effort, extending not only into the field of lectures, but, more importantly, into matters, such as ward rounds, small group discussions of individual patient problems, analysis of history and physical examination findings, differential diagnostic procedures, instruction in the techniques of surgery by the performance of surgical operations, interpretation of special tests, advice on treatment plans for difficult or unusual conditions, and recommendations and assistance on matters relating to residency training practices.

The Navy offers in its own hospitals a total of 64 A. M. A. - and Board-approved residencies in Surgery. Residencies also are available in the surgical specialties of Orthopedic Surgery, Ophthalmology, Otolaryngology, Gynecology, Urology, and Thoracic Surgery. Residency training for medical officers is sponsored in selected civilian institutions for those surgical specialties wherein the Navy does not conduct Board-approved programs. These include Plastic Surgery, Neurological Surgery, and Children's Orthopedics, the last constituting one of the four years of total training for those who have completed or are about to complete three years of training in programs approved and accredited for Adult Orthopedics and Fractures.

Eligibility to compete for residency training under Naval auspices is, in the main, confined to medical officers of the Regular service. Medical officers of the U. S. Naval Reserve on active duty may be considered for residency training in Surgery or surgical specialties when shortage of supply of Regular trainees exists in those fields at the time applications for training are received. However, Reservists, to be eligible for consideration for such assignments, must have already completed all active military service obligations imposed by the Universal Military Training and Service Act, as amended. In return for each year of residency training received in a U. S. Naval Hospital, each medical officer is required to serve one year of active duty, exclusive of each residency year. The obligation for Navy-sponsored residency training in civilian institutions is two years for the first year of training and one year for each year of training thereafter. Thus, the obligation for a four-year surgical residency in a civilian institution would be five years. and in a U. S. Naval Hospital, it would be four years.

During the past seven years, 450 physicians have received part or all of their surgical residency training as medical officers of the U. S. Navy, mostly as Regulars in U. S. Naval Hospitals. Up to 18 months ago, all too many of these left the service for civilian life after completion of their obligated service for training received. But a steadily increasing trend has developed since that time wherein medical officers who have completed



their training are electing to remain in the Navy as Regulars, not only as a career for assignment to billets commensurate with their professional skills, but as highly capable surgeons who contribute immeasurably to the perpetuation of the training programs in Surgery. On January 1, 1957, there were 102 Board-certified or Board-eligible general surgeons on active duty, most of whom are medical officers of the Regular establishment. Current estimates indicate that in four years the number will have increased to about 165 which more nearly approaches the Navy's minimal peacetime operational requirements.

That the residency training programs furnish a major initial incentive for transfer to the regular Medical Corps of the U. S. Navy is evidenced by the fact that the majority of officers accepting such commissions during the past few years did so for the purpose of being assigned to those programs. Indications now point increasingly to the likelihood of a good majority of these men making a career for themselves in the Medical Department of the Navy. It will be a very happy and fortunate circumstance, indeed, if this pattern continues to prevail, for the so-called Doctors' Draft Law is just as unpopular with military authorities as with their civilian counterparts and with the profession of medicine at large in the United States. The only remedy for this difficult and trying situation is a potent nucleus of career medical officers. The Medical Department of the U. S. Navy, as well as of the U. S. Army and the U. S. Air Force, are urgently in need of the positive assistance and staunch support of all civilian physicians throughout the United States for the purpose of attracting a sufficient number of physicians to careers in military medicine to fulfill the critical responsibilities called for in our Constitution and in the Public Laws of the Congress. The potential catastrophic consequences of enemy thermonuclear, biological, and chemical warfare attack render it absolutely imperative that medical professional societies, organizations, institutions, and individuals everywhere in the country come forth with positive programs of action to help the Medical Departments of the U. S. Navy and her sister services accomplish their cardinal missions. The new Public Laws of the 84th Congress relating to military career incentives, dependent medical care, and survivors' benefits, including Social Security, all should attract more physicians to electing the military as a financially sustaining, professional rewarding, and wholesome career. (Captain Robert B. Brown, Captain Malcolm W. Arnold MC USN)

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The printing of this publication was approved by the Director of the Bureau of the Budget, 16 May 1955.

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### Medical Service Corps Career Incentives

H. R. 2460, the Armed Forces Nurses and Medical Specialists Career Incentive Act, was enacted as Public Law 85-155 on 21 August 1957 when the President signed the measure into law.

In addition to the benefits which will accrue to officers of the Nurse Corps under this new law, the status of Medical Service Corps officers is greatly improved by this important legislation. Features of the bill relating to the Medical Service Corps are:

1. The 2% limitation on the number of officers who may serve in the grade of captain is repealed. Although no immediate promotions will result from this action because of the running mate principle, removal of the limitation will permit our officers to attain eligibility for promotion with their line running mates. Under the former limitation, most Medical Service Corps officers would never have promotion opportunity to captain because the limitation would have been reached before their running mates brought them into a promotion zone.

2. Medical Service Corps officers will serve as members of selection boards convened to recommend Medical Service Corps commanders, lieutenant commanders, lieutenants, and lieutenants (junior grade) for promotion to the next higher grade. The law provides that one-third of the members of such boards shall be officers of the Medical Service Corps.

3. Women officers of the Medical Service Corps of the regular Navy may, upon application made not later than January 30, 1958, be reappointed in the Corps under the provisions of law applicable to male officers. Women officers of the Medical Service Corps of the Naval Reserve who were appointed before the effective date of this Act are now considered to have been appointed under the provisions of law applicable to male officers of the Naval Reserve. All officers so reappointed—Regular and Reserve—will retain their permanent grades and dates of rank as well as accrued leave to their credit. Up to now, all women officers of the Medical Service Corps have been administered as WAVE officers under the Armed Services Integration Act, and have been subjected to the involuntary retirement dates and promotion limitations prescribed for WAVE officers. They may now become lineal list officers with male running mates thereby acquiring promotion opportunities at an earlier date, and to all grades up to and including captain. The Chief of Naval Personnel will inform the women Medical Service Corps officers of the regular Navy of their opportunity for reappointment under the Act in time to permit their applications to be made before the deadline date of January 30, 1958. Women Medical Service Corps officers of the Naval Reserve will have their status changed administratively to that of lineal list officers without any action on their part.



Thus, the Medical Service Corps has passed another significant milestone in its progress as an effective arm of the Medical Department of the Navy. The benefits which have been won again highlight the highly successful efforts of the Surgeon General in obtaining career incentives and rewards for all Medical Department personnel. Certainly, no other measure since the establishment of the Medical Service Corps by law in 1947 has done so much to give these officers equity with their line contemporaries. (MSC, BuMed)

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### Psychopharmacology

A clearinghouse of information on psychopharmacology is being established by the Psychopharmacology Service Center of the National Institute of Mental Health. An extensive collection of the literature in this field, including pharmacological, clinical, behavioral, and experimental studies of the ataraxic, psychotomimetic, and other centrally acting drugs, will be classified and coded to enable the staff to answer a wide variety of technical and scientific questions. As soon as enough materials have been assembled, the Center plans to offer bibliographic and reference service as well as the preparation of critical and analytic reviews of special topics in the field.

In order to accelerate the growth of the literature collection, the Center invites persons working in this field to provide three copies of any papers that deal with their work—whether reprints, prepublication manuscripts, progress reports, informal mimeographed reports, papers read at meetings, or abstracts. Letters outlining work in progress would also be welcome. Any restrictions that authors may wish to place on the Center's use of their papers will be strictly observed. All materials should be addressed to the Technical Information Unit, Psychopharmacology Service Center, National Institute of Mental Health, 8719 Colesville Road, Silver Spring, Md. (PHS, HEW)

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### Chain of Command

This article, which appeared in the July 1957 Information Bulletin of Commander Service Force Pacific, is considered to be of interest to, and worthy of consideration by ALL PERSONNEL.

One of the basic principles of good leadership is the exercise of authority through the chain of command. What do we mean by the chain of command? It is the channel over which direction of command must flow. It normally



follows the direct route of assigned responsibility; from the captain to the executive officer and down through the head of department, the division officer, the chief petty officer, the leading petty officer, and the non-rated man. The main chain of command may also have minor variations, such as the segment between the commanding officer and the officer of the deck in matters of ship control. Authoritative direction may begin at any link in the chain. Reports and information may flow in either direction through the chain.

Every officer, chief petty officer, and petty officer in the chain of command must have a well-defined authority in order to discharge his assigned duties and tasks. He must also have a full appreciation of the personal responsibilities that go with this delegated authority. These personal responsibilities include the training, coordination, and supervision of the performance of duty of his assigned subordinates. They include, in addition, the coordination with others who are carrying out similar or related duties. Inherent in these responsibilities is the requirement of following the chain of command in the exercise of authority. These responsibilities extend upward along the chain for the performance of himself and his subordinates and down along the chain to support his subordinates.

Why do we fail at times to follow the chain of command? Usually because there is a weak link therein, sometimes through impatience, often through negligence, and even ignorance. The ineffective leader tends to bypass the weak link in the chain of command. The strong leader will recognize the weakness and strengthen the faulty link through better leadership training and supervision. As a last resort, it may be necessary to replace the link or use it in another portion of the chain where it is strong enough to take the load. The exercise of patience, care, and knowledge of the chain of command are essential to a strong and effective command structure.

The leader who understands and follows the chain of command, who appreciates the degree of his authority and responsibility will have taken a basic step toward being a good leader. He will be confident in his men and they will have confidence in him.

Are you following the chain of command?

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#### From the Note Book

1. The Bureau of Medicine and Surgery celebrated its 115th anniversary on August 31, 1957, the only Bureau still retaining its original name as established by Congress in 1842. Since the days of the first Surgeons and Surgeon's Mates in the Colonial Navy, 115 years ago, the Medical Department and its personnel have achieved a history of which they can be justly proud. Through improved techniques, equipment, supplies and facilities, personnel, training qualifications, and organization, their record of improving and maintaining the health of the Navy and of the Nation is one of continued progress. (TIO, BuMed)



2. Captain J. L. Enyart MC USN (Ret) has been appointed administrator of the Institute of Physical Medicine and Rehabilitation, New York University, Bellevue Medical Center, New York, N. Y. (J. A. M. A., August 24, 1957)

3. Navy Programs for Dental Students, a pamphlet prepared by the Dental Division, Bureau of Medicine and Surgery, will be distributed to all Naval Districts for use in the Navy Dental Officer Procurement Program. The pamphlet sets forth general information, benefits, and eligibility requirements for the Ensign 1995 (Dental) USNR Inactive Duty Program and the Dental Ensign Orientation Program. Information is included regarding membership in Naval Reserve Dental Companies while attending schools of dentistry, and instructions for civilian applicants for appointment in the Dental Corps of the U. S. Navy and Naval Reserve. (TIO, BuMed)

4. Reports on a wide variety of research projects aimed at protecting and advancing people's health will be highlights of the 5-day 85th annual meeting of the American Public Health Association and meetings of 40 related organizations beginning Monday, November 11, 1957. (APHA, INC)

5. Aerotitis media is a syndrome caused by obstruction of the auditory tube and its consequent failure to properly ventilate the tympanic cavity during rapid changes in atmospheric pressure. It characteristically occurs in flight, usually during quick descent, but it may also take place during compression in those working under increased air pressure, as in caissons and submarines. It is noninfectious in nature. (Arch. Otolaryng., August 1957; D. C. Schechter, M. D.)

6. A classification of color deficiency is proposed which is scientifically accurate, but is simple and adequate for industrial use. Commercially available tests have been selected which identify each of 3 degrees of color deficiency. It is emphasized that color vision testing for industry cannot properly be limited to "color blind-not color blind." After job analyses have determined the degree of color discrimination required for the occupation, the color vision tests described can be used for personnel selection. (Arch. Indust. Health, August 1957; CDR D. Farnsworth MSC USN)

7. In this article, the author discusses his reasons for believing that all ulcerating lesions of the stomach are surgical problems from the moment of diagnosis. (Arch. Surg., August 1957; J. E. Strode, M. D.)

8. This investigation was designed to study the incidence of infantile hypertrophic pyloric stenosis in a community in the United States with special attention to the incidence in Jews and Negroes in this population group. (J. Dis. Chil., August 1957; Z. Laron, M. D., L. M. Horne, M. D.)



9. All glaucomatous eyes should be periodically subjected to perimetric study, ophthalmoscopic and slit lamp examination, refraction, gonioscopy, and measurement of the intraocular pressure. (Arch. Ophth., August 1957; W.H. Morrison, M.D.)

10. Observations on the etiology, course, and management of ulcerative colitis are presented in Postgrad. Med., August 1957; J.B. Kirsner, M.D.

11. The prevention and treatment of acute ligament injuries in athletes is discussed in GP, August 1957; D.H. O'Donoghue, M.D.

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### "Welcome Aboard"

The following listing of HC personnel represents the first 37 who will be appointed as Ensign in the Medical Service Corps, Supply and Administration Section during fiscal year 1958. All have been ordered, and by 14 September 1957 will have reported, to Officer Candidate School, Newport, R.I., for a 7-week course of indoctrination. Appointments will be effected subsequent to arrival at OCS upon completion of indoctrination, the appointees will report to duty assignments as Medical Service Corps officers:

Aaron, Alvin "J" HM1	McDermott, Rowland W. HM1
Baldauf, George W. HM1	McFee, Charles A. HM1
Bertka, Robert E. HM1	Moore, Charles J. HM1
Blankenship, William L. HM1	Mullinix, Chloe A. HM1
Bowdren, Laurence P. DT1	Nourigat, Earl R. HM1
Bryant, Eugene M. HM1	Novak, Paul J. HMC
Collier, Patrick J. HM1	Nowak, Frederick F. HM1
Condon, Earl N. DT1	Pearce, Charles J. HM1
Correll, Joseph M. HM1	Peckinpaugh, Normand L. HM1
Dunham, Chester J., Jr. HMCA	Rucker, Thomas J. HM1
Eckerman, Weldon R. HM1	Simmons, Carl B. HMC
Flower, Norman L. HM1	Stephens, Bobby L. HM1
Freeman, Benjamin C. HMC	Stephens, Charles T. HM1
Hatch, Emery J. HM1	Stitzel, Forrest D. HM1
Lawson, Donald R. HM1	Surface, Robert L. HM1
Leadford, William M. HM1	Swindall, Victor A. HM1
Littner, Henry D. DTC	Thompson, Russell J. HM1
Mc Clung, Denzel H. HM1	Webb, Laurence H. HMC
Young, Arthur L. DT1	

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### Policy

The Medical News Letter is basically an official Medical Department publication inviting the attention of MD officers of the Regular Navy and Naval Reserve to timely items of official and professional interest relative to medicine, dentistry, and allied sciences. The information used is only that necessary to inform adequately MD officers of the existence and source of such information. The items are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers are urged to obtain the original of items of particular interest to the individual.

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**DENTAL****SECTION**

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### Slide Study Sets on Loan

The U. S. Navy Dental School, National Naval Medical Center, Bethesda, Md., announces that a new slide study set on Non-Neoplastic Oral Lesions is available on a short term loan basis. The set consists of 25 microscopic slides prepared from specimens received in the Pathology Division of the Dental School and a 55-page syllabus.

The syllabus is divided into two sections. In the first section are the clinical notes which accompanied each specimen when it was submitted for diagnosis. In the second section are the histologic description, diagnosis, and pertinent remarks for each case. The syllabus was prepared in this manner to encourage the user of the study set to make his own written description and diagnosis before referring to the histologic description and diagnosis in Section II.

The new study set is the second in a series of packaged sets being prepared by the U. S. Naval Dental School. The first set, an illustrated lecture on Remount Technique for Occlusal Correction of Complete Dentures, was announced in Vol. 29, No. 12, Medical News Letter. The set consists of 53 35-mm. colored slides, slide file, hand viewer, carrying case, and a bound narration in lecture form. Requests to borrow either set should be submitted as directed in Vol. 29, No. 12 of the News Letter.

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# Operation Build-Up - Navy Dental Corps

## DENTAL OFFICERS APPOINTED IN THE U.S. NAVY\_\_

DURING THE PERIOD  
20 JUNE 1957 TO  
1 JULY 1957

ROBERT W. ALLEN

THOMAS M. ALLENSWORTH

WILLIAM L. COMCOWICH

JAMES E. CORTHAY

GEORGE B. CROSS

HAROLD E. FREEBURN

DAN C. GHOLSON

RICHARD J. GOOD

DALE R. HANDS

ROBERT J. HARLAND

RICHARD V. Lolla

RICHARD M. MAYBERRY

CHARLES W. McGARY

EUGENE J. MESSER

JAMES E. MILLER

WILLIAM J. NEWELL

FRED A. OLSON

DAVID T. RUSSELL

JOSEPH P. RYAN

KENNETH D. SIPE

THOMAS E. STUMP

HERBERT O. TIETZER, JR.

EDWARD J. TRUSZ

WARREN R. WESTERHOFF

1,134 - AUTHORIZED MAXIMUM

1,100

1,000

900

923 - 1 JULY 1957

849 - 1 DECEMBER 1956

800

774 - 30 JUNE 1956

700

699 - 25 AUGUST 1954

From August 1954 (the beginning of Operation Build-Up) to 1 July 1957, 224 dentists have chosen Navy careers. There are now 923 Regular Navy Dental officers on active duty.

REGULAR NAVY  
DENTAL OFFICERS



### Board Certifications

CAPT Myron G. Turner and CDR William M. Marking DC USN were certified recently as diplomates of the American Board of Prosthodontics. CAPT Turner is on duty at the U. S. Naval Air Station, North Island, San Diego, Calif., and CDR Marking is on board the USS Bushnell (AS-15).

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### 98th Annual Session of ADA

CAPT Bernard H. Faubion DC USN, Deputy Chief, Dental Division, Bureau of Medicine and Surgery, has been selected as a member of the House of Delegates at the 98th Annual Session of the American Dental Association to be held at Miami Beach, Fla., November 4 - 7, 1957. CAPT Faubion will also serve as a member of the Reference Committee on Dental Education.

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## RESERVE SECTION

### Satisfactory Year - Anniversary Year

Commencing 1 July 1949, an inactive Naval Reservist must earn 50 retirement points per anniversary year in order to receive credit for a year of "satisfactory Federal service" for retirement purposes. These retirement points may be earned as follows:

1. One point for each day of active duty or active duty for training including travel time
2. One point for each duly authorized drill attended in either pay or nonpay status
3. One point for each period of equivalent instruction or appropriate duty performed as authorized by the commandant or Chief of Naval Personnel
4. Point credit for complete authorized correspondence courses. The point credit varies in accordance with the course completed. For officers, these points are credited in 12-point units in the anniversary year in which the unit is completed. For enlisted personnel, the points



are credited on the completion of the course on the dates on which each assignment is submitted.

5. Fifteen points are credited for each year of membership in the Naval Reserve.

A maximum of 60 points per year may be credited by means of (2) through (5) above.

The "anniversary year" for those individuals who were members on 30 June 1949 will be 1 July to 30 June. For those members entering after 30 June 1949 or whose service was broken after that date, the anniversary year extends from the date entered or reentered as a Naval Reservist. An entry is considered to be the first appointment or enlistment of a member in the Naval Reserve. In the case of a Regular Navy officer resigning from the Navy and accepting an appointment in the Naval Reserve, his anniversary date will be the date that he accepts his appointment in the Naval Reserve. A reentry is when the member has resigned or has been discharged from the Naval Reserve and was not immediately reappointed or reenlisted, or when his Reserve service has been broken by service in the Regular Navy. The 50-point requirement for a year's satisfactory service may be prorated for a partial year and the 15 gratuitous points are similarly prorated. In order to so prorate, the status of the member must change at the end of the period to be prorated, that is, by resignation, discharge, or transfer to the inactive status list or Retired Reserve.

A Reserve officer may, once a year, obtain a statement of his "satisfactory Federal service" by addressing a request directly to:

Officer in Charge  
U. S. Naval Reserve Officer Performance  
Recording Activity  
30th and Fort Streets  
Omaha, Nebraska

An enlisted Reservist may obtain information as to whether he has a satisfactory year from the commanding officer of the organized unit to which attached or from the commandant of the naval district where his service record is maintained.

For additional information concerning a "satisfactory Federal year of service" and the "anniversary year" as relates to the nondisability retirement with pay for members of the Naval Reserve, see BuPers Instruction 1820.1B of 20 May 1957.

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Low Temperature Sanitation - Cold Weather Medicine  
Correspondence Course

The Medical Department correspondence course, Low Temperature Sanitation and Cold Weather Medicine, NavPers 10997-A is now available



to Regular and Reserve officers and enlisted personnel of the Medical Department. This course consists of three (3) assignments and is evaluated at nine (9) Naval Reserve promotion and/or nondisability retirement points. Naval Reserve officers who have completed the correspondence course, Frigid Zone Medical and Dental Practice, NavPers 10997, may also complete this course to obtain additional credit.

The discussions of the course relate to low temperature sanitation on permanent installations and the practice of cold weather medicine. The course also includes discussions of peculiar biological circumstances brought about by a cold climate as related to water supply, sewage disposal, and garbage disposal as well as a section pertaining to cold weather medicine practice relating to cold injury, snow blindness, carbon monoxide poisoning, psychological problems and dentistry.

Applications for this course should be forwarded via applicant's command on Form NavPers 992 (Rev 2-56) to the Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md.

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ABC Warfare and Civil Disaster Program  
in Twelfth Naval District

The U S Naval Radiological Defense Laboratory, San Francisco Naval Shipyard (Hunters Point), will conduct a seminar during the 3-day period, 17 - 19 October 1957, under the sponsorship of the Commandant, Twelfth Naval District. Speakers and discussants scheduled to present the program include prominent military and civilian physicians and scientists.

The Chief of Naval Personnel has authorized the awarding of one (1) retirement point credit to eligible inactive Naval Reserve Medical Department officers for daily attendance, provided they register such attendance with the authorized military representative present. Security clearance is not required.

Additional information concerning this program may be obtained by writing to the District Medical Officer, Twelfth Naval District, 50 Fell St., San Francisco, Calif.

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Military Medical-Dental Symposium - Fourth District

A symposium for the Armed Forces will be presented at U. S. N. H., Philadelphia, 23-25 October 1957, on Modern Trends in Military Medicine, presented by specialists in subjects of interest to Medical, Dental, and Nursing professions. Retirement point credits for eligible inactive Reservists have been authorized, provided attendance is recorded. For information, address District Medical Officer, Bldg. 4, U. S. Naval Base, Philadelphia 12, Pa.





## PREVENTIVE MEDICINE SECTION

### Smallpox Vaccine Must Be Frozen

A Navy Preventive Medicine Unit recently reported encountering numerous instances in which smallpox vaccine was being kept at normal refrigeration temperatures.

Article 22-22 (3) Manual of the Medical Department, USN, is specific for the requirement that smallpox vaccine must be maintained in the frozen state and contains the statement, "Under no circumstances shall the virus remain for as much as 1 hour at temperature above 5° C. (41° F.)."

Smallpox and yellow fever vaccines are live virus vaccines and thus differ from other vaccines in common use. To be effective in producing immunity, the virus must be kept alive. Both viruses die rapidly at room temperature. While refrigeration will slow the viral death rate, a vaccine at "refrigerator" temperatures (36° - 40° F.) will remain potent for much less than the potency dating period which is predicated on storage at temperatures of less than 32° F. Few commercial refrigerators of the type used in dispensaries will maintain temperatures below 40° F. at all times. Therefore, the assumption should be made that all stocks of smallpox vaccine now stored outside of freezer compartments of the refrigerator have deteriorated and are unfit for use. Such stocks should be immediately discarded and replaced.

Be reminded that smallpox is epidemic in many parts of the world to which military personnel travel on short notice and is still a highly fatal disease. In these epidemic areas, even people who have been vaccinated with potent vaccines often become infected, but the illness in such people is usually abortive and nonfatal. The man you vaccinate today and issue an immunization certificate to may be in one of these areas in a few weeks or months. Be sure the vaccine used for his immunization is potent. Proper storage is the only way to insure this, as even a weekly potent vaccine may give a few "takes" and dead smallpox virus sometimes causes local reactions which are read as "immune" reactions. (Communicable Disease Branch, Preventive Medicine Division, Bureau of Medicine and Surgery)

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### 1958 Industrial Health Conference

The 1958 Industrial Health Conference will be held in Atlantic City N. J., 19 - 25 April 1958. As in the past, the conference will be composed of various disciplines concerned with those preventive measures necessary to protect personnel against conditions in the working environments that may adversely affect health. Organizations jointly sponsoring the conference are:

Industrial Medical Association  
American Conference of Governmental  
Industrial Hygienists  
American Industrial Hygiene Association  
American Association of Industrial Dentists  
American Association of Industrial Nurses, Inc.

The Bureau of Medicine and Surgery desires active participation of naval personnel, both military and civilian, at the conference by presenting papers on subjects in the field of occupational health and by participating in round table discussions. Prepared papers should be sent to the 1958 Industrial Health Conference Program Committee, c/o Edward C. Holmblad, M.D., 28 East Jackson Blvd., Chicago 4, Ill., by 15 November 1957.

Due to rapid technological changes occurring in naval industrial activities, there are new health problems and questions that come up during the year in connection with the conduction of naval occupational health programs. With this in mind, it is planned to have a half day meeting of naval occupational health personnel attending the conference to discuss these problems and possible solutions. The time, date, and meeting place will be announced during the first or second day of the conference. In preparation for the Navy meeting, comments of general interest, recommendations, or questions regarding naval occupational health programs should be forwarded to the Bureau of Medicine and Surgery at an early date. (Occupational Health Branch, Preventive Medicine Division, Bureau of Medicine and Surgery)

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### Insecticide Resistance

Medical science has found bacteria which are no longer killed by penicillin and other antibiotics. Canadian agriculturists have bred wheat resistant to the red-rust fungus, only to find that a rust fungus appears that can attack the resistant wheat. Chemists and entomologists have produced "wonder insecticides" only to find a few years later that the results—far from being wonderful—are a downright failure.

The wonders of DDT in reducing the great insect-borne pestilences, such as malaria, yellow fever, typhus, plague, and many types of dysentery,



are well known. Recent findings show that in some parts of the world DDT is no longer controlling the mosquitoes, lice, fleas, and houseflies that transmit these diseases and—although difficult to realize—it is the insects which have changed to become resistant to DDT.

The phenomenon of insecticide resistance was first observed in Agriculture. In 1913, it was proved that the San Jose scale—an insect pest of apple orchards—was no longer controlled by lime-sulphur in the State of Washington because the insect had changed to lose its former susceptibility.

In 1916, the red scale and black scale, insect pests of citrus orchards in California, were proved to have developed resistance to the hydrogen cyanide fumigation generally practiced for their control.

In 1928, the sensational decline in effectiveness of lead arsenate sprays against the codling moth in Colorado was proved to be due to the developed resistance of the insect, the common "apple worm."

Later, another scale insect developed resistance to cyanide in California; the citrus thrips became resistant to tartar emetic sprays in California and the Transvaal; and the cattle tick and blue tick became resistant to sodium arsenite dips in Australia, South America, and South Africa.

This was the picture when, towards the end of World War II, DDT was introduced for malaria mosquito control in Italy and at the same time effected a sensational reduction in the numbers of houseflies and the incidence of infant dysentery.

In the spring of 1947, in the coastal plain of the Tiber, it was found that the houseflies were no longer killed through contact with sprayed walls of houses and that respraying with DDT of certified quality would no longer control them. On being taken into the laboratory and bred for generations free of DDT, these flies maintained this DDT resistance. At first, public health scientists thought they had discovered a new variety of housefly which they named Musca domestica, var. tiberina, even though no visible differences from the normal species could be found, but laboratory experiments started two years previously in Orlando, Fla., had shown that if susceptible houseflies are exposed to DDT in each generation and bred from the survivors, the susceptibility steadily decreases until the flies become practically resistant.

In the same year, DDT-resistant houseflies appeared in Greece and Denmark, and in 1948, in New York, New Jersey, Illinois, Florida, and California. Subsequently, it was found that wherever DDT was brought into systematic use—whether in the Eastern Mediterranean area, South America, or New Zealand, the flies became DDT-resistant in about 2 years. Laboratory experiments confirmed that selection pressure with DDT made a DDT-resistant strain out of a normally susceptible one and that no visible anatomical differences characterized the resistant strain.

One exception should be mentioned, namely, the DDT-resistant flies discovered at Arnas in Northern Sweden in 1946 which were darker and



thicker-skinned in the feet and tarsal pads; but this is probably a normal characteristic of the houseflies in that remote and cold country.

New "wonder insecticides," such as benzene hexachloride (BHC), chlordane, and dieldrin, were produced with encouraging results at first, but generally within a single year the houseflies again showed resistance. Compounds were discovered which, added to DDT, made it insecticidal to resistant flies; however, in a few generations of exposure the flies became resistant to the mixtures.

At present, a class of compounds known as the organophosphorus insecticides (e.g., parathion, malathion, and diazinon) has been introduced for fly control. Although these are not so effective as DDT and the other chlorinated hydrocarbons were, the housefly does not become resistant to them very quickly. However, control failures with organophosphorus compounds have recently developed in Denmark.

Not until about 1951, did any cloud appear to disturb the clear skies of malaria control by DDT house spraying. Anti-malaria workers in Greece found in the fifth year of their countrywide program that the mosquito vectors, Anopheles sacharovi, were resting comfortably on sprayed walls in certain villages. As the years went on, the situation became worse and more widespread, the resistance extended to BHC, chlordane, and dieldrin as well as DDT and involved the two other local species of Anopheles. In 1954, DDT resistance appeared in A. sundaicus on the north coast of Java; in 1955, in A. stephensi in Saudi Arabia. Dieldrin resistance appeared in 1955 in A. quadrimaculatus in Mississippi; and in A. gambiae of Northern Nigeria.

Also in 1951, when DDT powder was used for delousing, the first cloud appeared on the horizon of typhus control. Soldiers of both armies in Korea were found to harbor body lice that were resistant to DDT. A similar resistance was found in the lice infesting vagrants in Japan. In succeeding years, DDT resistance has developed in Egypt, Iran, Turkey, Ethiopia, South Africa, Chile, Peru, and other countries. BHC resistance is now general in Japan.

By 1951, DDT resistance of the flea, Pulex irritans, vector of plague, had developed in Peru, Ecuador, Greece, and Palestine.

In 1955, DDT resistance was reported in the yellow fever mosquito, Aedes aegypti, in Trinidad.

At present, resistance to DDT is shown by the bedbug in parts of the United States, India, Iran, Israel, and Taiwan. The German cockroach has developed resistance to chlordane and similar insecticides in most urban centers in the Southern United States. The cattle tick in Australia and the blue tick in South Africa are resistant not only to BHC, but to chlorinated hydrocarbon insecticides in general.

So the insects are fighting back in their own way as dictated by the inexorable laws of nature. Through what qualities have they become resistant where they were susceptible before?



One possibility is that they are just tougher generally and can better withstand inimical conditions, be they heat, cold, drying-out, or an insecticide. This was almost certainly the reason for the resistance of the codling moth to lead arsenate in Colorado, for the resistant larvae were found to live longer on a sprayed apple and thus have a better chance of finding an arsenate-free area to bore into. Being simply tougher was probably a characteristic of the DDT-resistant houseflies in Northern Sweden.

Instances where flies or mosquitoes gradually accumulate moderate resistance to insecticides in general—not just to the one being used—fall into the category to which American workers have given the name "vigor tolerance." Generally, resistance is much more specific than this and there are many examples of intense DDT resistance without any increase in general toughness or decreased susceptibility to other insecticides.

Excellent biochemical research in the United States has shown that DDT-resistant houseflies contain an enzyme which normal susceptible strains do not (or if so, in traces only). This particular enzyme, DDT dehydrochlorinase, is present in all tissues of the fly and especially in its integument or body wall. As the DDT enters the body through the integument, this enzyme dehydrochlorinates it, leaving the harmless compound DDE. The same enzyme protects the internal tissues from any DDT that may get into the body cavity unchanged. A similar detoxification mechanism is found in the resistant Aedes aegypti mosquito from Trinidad.

Laboratory experiments over many months have shown how the application of DDT (or BHC, dieldrin, chlordane, et cetera) can build up the resistance from generation to generation. If the flies are then removed from the insecticide, the resistance persists for several generations at least—it is present as a fixed characteristic.

One possible explanation is that exposure of an individual insect to DDT during its lifetime increases its tolerance much as an individual human can acquire tolerance to eating arsenic or to certain drugs, and indeed the description of resistance as an "acquired tolerance" might convey this impression; but straightforward research has proved this wrong. Exposure of a fly or other insect to mild doses of DDT does not make it more tolerant of heavier doses given later. The resistance level of the next generation cannot be increased unless the DDT has been at such a level that it has killed off the more susceptible of the prospective parents.

This is the Darwinian theory of evolutionary change by environmental selection in its pure and classical form and sets it in bold relief against the Lamarckian fallacy that all changes are acquired from the environment and all so acquired are inherited.

Those flies that are constitutionally (i. e., genetically) less susceptible survive to produce the next generation. The genes they contain which make for less DDT susceptibility make the next generation more DDT resistant than the last. Successive elimination of individuals with genes for DDT



susceptibility concentrates the DDT resistance genes more and more so that ultimately the population is entirely DDT resistant.

Where then do these DDT-resistant genes come from? Can they have been induced through mutation from normal genes by the action of the DDT itself? A very few chemicals (e.g., colchicine, nitrogen mustard) are known to be mutagenic, but DDT has been proved by recent experiment not to induce mutations. Therefore, it is concluded that in the housefly the genes for resistance are present in normal populations in very low frequency only awaiting selection by the insecticide—DDT in this case—to increase that frequency in successive generations.

Supporting evidence for this view has recently come from Northern Nigeria. Since June 1954, the houses had been sprayed with dieldrin against Anopheles gambiae. After three cycles of spraying, some of these mosquitoes were submitted to test in November 1955 and found to be (as a group) eight times as resistant to dieldrin as those in an unsprayed area. Eggs of A. gambiae were collected from Ambursa in the sprayed area and air-mailed to the Ross Institute in London. Approximately 5% of them hatched—enough to found a laboratory colony which was surprisingly easy to breed. As soon as it had reached sufficient size, a group of this colony was submitted to test with dieldrin. As a group, it proved to be 800 times as resistant as a normal A. gambiae colony from Lagos in coastal Nigeria. The dieldrin-resistant Ambursa mosquitoes were then mated with the susceptible Lagos mosquitoes. The results of the mating crosses through three generations showed that the hybrids were intermediate in resistance and carried one gene for dieldrin resistance while the Ambursa strain carried two.

A survey in Northern Nigeria showed that in sprayed areas 90% of the mosquitoes found in the houses carried two of the resistant genes while in an unsprayed area 0.04% carried one of the resistant genes (the other individuals carrying the normal susceptible genes). These results show that a gene giving dieldrin resistance existed in this species of mosquito before the species ever came in contact with this insecticide.

The future course is now clear—research must go on. Regions of Africa in which dieldrin might be used in malaria control must first be surveyed to see if this particular gene exists in the indigenous A. gambiae. Where it does, the use of dieldrin is doomed to eventual failure. However, the dieldrin-resistant A. gambiae, although resistant also to BHC, is quite susceptible to DDT. Therefore, DDT should be the insecticide of choice against such populations and indeed the Nigerian operations in 1956 showed it.

The dieldrin-resistant A. quadrimaculatus of the United States is still controlled by DDT. On the other hand, the DDT-resistant A. sundaius in Java is still susceptible to dieldrin and so is A. stephensi in Arabia. The DDT-resistant Aedes aegypti is susceptible to BHC.

It has been the experience with the housefly, with Culex fatigans, and with Anopheles sacharovi in Greece that DDT-resistance may be quite quickly



followed by resistance to the other chlorinated hydrocarbons, thus eliminating the only group of insecticides which have made nationwide disease eradication programs economically feasible. Insecticides of long residual effect against mosquitoes have not been found in any other group.

In the race between these eradication campaigns and the development of insecticide resistance, there is an urgent need for increased research on many fronts—for only research provides the knowledge and understanding which may produce countermeasures against the onset of resistance. (Brown, A. W. A., How the Insects Beat Our Poisons: World Health, 10: 5, May-June 1957)

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### Safety First - Not Last

As more and more people take to the open highways, it can be said with certainty—albeit with sorrow—that hundreds will meet violent deaths in automobile accidents. Nonmedical experts have painted this terrifying picture: A traffic death in the United States on the average of every 14 minutes, an injury every 25 seconds, and a mounting death toll yearly.

Many reasons have been advanced to explain this national calamity—super highways, high speed limits, youthful drivers, poor vision, "one for the road." Yet too little has been said until recently of the design of the conventional cars—low-slung and glamorous—built for speed and show, but with not enough attention to durability in case of accident.

A new safety automobile which was designed to give both driver and passenger maximum protection against collision injuries is the result of a joint study undertaken by the Cornell Aeronautical Laboratory and the Liberty Mutual Insurance Company.

Revolutionary in design, the Liberty-Cornell safety car possesses the following exterior features:

1. Rounding bumpers to produce a glancing blow rather than a direct one
2. Side bumpers to reduce shock of impact and property damage
3. Energy absorbing material between the bumper face and frame
4. Recessed headlights to avoid protuberances of the front end

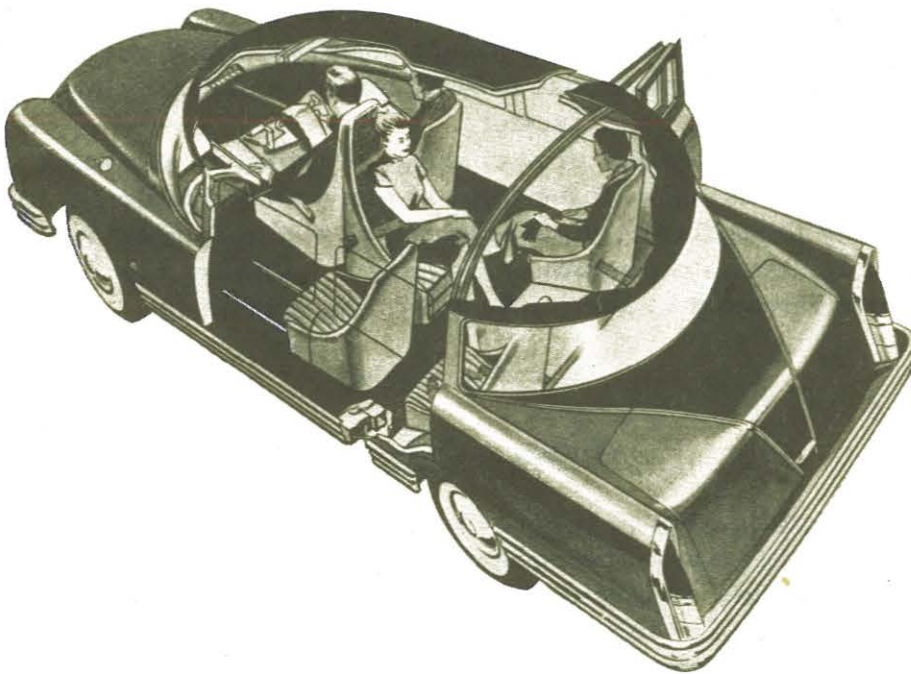
Even more daring in concept are the major changes made in the interior design. The driver is placed in the center, flanked by two slightly lower passenger seats. This position permits maximum visibility and better control of the car in the event of a collision. The steering wheel is replaced by a lever-type, power-steering system; between the two steering handles runs a protective cushion. Under crash conditions, the driver is kept in position by a U-shaped webbing supported between two side arms. A webbed yoke and a chest pad give protection to the front seat passengers.



Conventional seats are replaced by bucket seats which provide more lateral restraint, afford strong mooring for seat belts, and reduce riding fatigue. Use of a protective rearward seat gives a "club car" effect which is pleasing to many people.

Augmented roof padding in the two regions just forward of the seats, roll-over bars to safeguard against body crushing, and special doors—double the width of conventional doors—which are hinged to fold together and swing outward and provide positive locking in case of a crash are other safety features of the Liberty-Cornell car.

### Liberty-Cornell Safety Car



Widespread use of this safety car should cut down greatly the number of highway fatalities and limit permanent disabilities suffered in automobile collisions. How soon such a car will be made available for general use depends on public demand—a public educated to accept safety in preference to the longer wider faster and more dangerous cars being designed today. A great need exists for change in public attitudes regarding the essential features of car design. Physicians can lend valuable support in this matter.

To meet the problems of ever increasing death and injury on the highways—viewed as a medical problem of major importance—the House of Delegates of the American Medical Association voted in June 1955 to create a special Committee on Medical Aspects of Automobile Injuries and Deaths to determine how such factors as driver-license standards and motor vehicle



design and equipment might be of legitimate interest to the medical profession.

At its Boston meeting in December 1955, the Committee urged President Eisenhower to request legislation "authorizing the appointment of a national body to approve and regulate safety standards of automobile construction." Such legislation was introduced in February 1957 by Senator Lyndon Johnson of Texas in his bill, S. 1292, proposing the establishment of a division within the Department of Health, Education, and Welfare to cooperate with other public and private agencies to reduce traffic accidents.

This proposal was also cited by Dr. John D. Rogers of the Michigan State Medical Society when he testified before the House Interstate and Foreign Commerce Committee's special subcommittee on traffic safety in March 1957. Dr. Rogers recommended that either manufacturers get together voluntarily to place proven safety features on all cars or that Congress should authorize a national body to approve and regulate safety standards of automobile construction.

Because the prevention of accidents—whether in the home or on the highway—properly belongs to the field of preventive medicine, it is incumbent upon every physician to do everything possible to help put an end to the wholesale slaughter on the nation's highways. (Safety First, Not Last: Massachusetts Physician, June-July 1957, pp. 200-204)

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### Prevention of Tuberculosis

That the eradication of tuberculosis depends as much on efficient preventive measures as on the cure of those suffering from the disease, is becoming increasingly apparent. The mortality figures have declined in almost every country in the world and the morbidity figures are beginning to follow the same pattern.

A factor which has accelerated the fall in the morbidity and mortality rates has been the recent advent of antibiotic therapy, but the foundation of the work that has produced these results lies in the improved standard of living associated with the establishment of an efficient public health service. The fundamentals of prevention of tuberculosis are to reduce the risk of exposure to the infection and to increase the resistance of the individual against the development of active disease if infection occurs. The former is insured by the discovery and control of infectious cases and the efficient treatment of those with active cases and the latter by a high standard of living. The well known antituberculosis measures can conceivably lead to a condition where the infectious person is a rarity, but when one is present a menace will exist because with the absence of continuous exposure to natural infection, the inherent resistance of a population is likely to decline.



It is thought that a time may be coming when the approach to the prevention of tuberculosis will have to be modified to meet the new situation of a small number of chronic infectious cases in a large population of noninfected individuals. To all of this must be added the danger of infection from countries in which active tuberculosis cases are numerous.

Milk free from live tubercle bacilli, mass radiography, and examination of the sputa of persons with symptoms of chronic respiratory disease have achieved a fair measure of success in controlling the spread of tuberculosis in the past, but other methods will have to be employed in the future to further cut the incidence of the disease as it becomes less common and the population more susceptible. These measures are: (1) the worldwide use of B. C. G. vaccine in children over 12; (2) periodic tuberculin testing of all children under 12; (3) the revision of the use of miniature radiography; (4) the extended use of antibacterial drugs in the treatment of primary infection; (5) special attention to the older age groups in the population; (6) provision for vaccination of migrants to countries where infection is prevalent; (7) establishing a register of active cases; (8) greater cooperation from the public; and (9) giving the general practitioner readier access to facilities for chest radiography.

The disadvantages of B. C. G. vaccine are: the immunity conferred is partial and temporary; if B. C. G. is given to infants, it rules out the use of tuberculin as a diagnostic and case finding agent; and it can produce, through overconfidence, relaxation of essential preventive measures. If risk of infection is high, the protective advantage outweighs the disadvantages. Because risk of infection increases with adolescence, vaccination at that age should be universal.

Assuming that B. C. G. is reserved for contacts and children under 12, infants and young children should be checked with serial tuberculin testing, e. g., at 2, 5, 9, and 12 years of age. Any positive reactor would be an index case from which a search for contacts would be conducted. Also, all who come into frequent contact with children should be periodically x-rayed.

The significance of the primary infection which is detected early by serial tuberculin testing of children is important because it indicates that there is an active infectious case in the neighborhood which must be eradicated. The tuberculin-positive child must be seriously considered for it means there are live tubercle bacilli in the tissue which can cause an active lesion. Mass miniature radiography is satisfactory for case finding as long as there are plenty of cases in the population, but when morbidity is low, it can become wasteful; e. g., mass radiography of school children is wasteful, but of elderly males, it is very productive. The main reasons for lack of cooperation on the part of the older groups are fear and apathy which can be conquered by education, physician persuasion, and making chest radiography a pre-employment and health examination must.

While isoniazid is known to be able to protect persons from developing tuberculosis, it is too early to use it extensively. This must await further data.



Chest x-rays should be required of all immigrants and emigrants and a careful follow-up should be maintained on all immigrants. The number and location of all infectious cases in the country, a knowledge of the influence of drugs on the disease, and the duration of case infectivity can be determined by the establishment of a central tuberculosis register for such cases.

Public cooperation can be increased through community health education which stresses the following points: (1) that it is important to diagnose and treat the primary lesion in all age groups, especially children; (2) that B.C.G. does not offer complete protection against tuberculosis; (3) that tuberculosis cannot be eradicated by antibiotics alone; (4) that healthy living under sanitary conditions, adequate diet, and rest are the best safeguards against tuberculosis; (5) the seriousness of spray infection by uncontrolled coughs and sneezes; (6) that the patient must not think that the disease is trivial because he can be treated at home; and (7) that the tuberculin negative person is in danger when in contact with an active case of tuberculosis. (Heaf, F., F.R.C.P., Prevention of Tuberculosis: Brit. Med. J., 5006: 1383-1388, December 15, 1956)

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